

Appl. No. 09/603,147

REMARKS

Claims 87 and 88 are amended. Claims 64-66 are cancelled. Claims 68, 70-77, 79-81, 83-84 and 87-94 are pending in the application.

Claims 64-66, 76-77, 79-81 and 83-84 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such away as to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed. The Examiner states that the claim 64 and 76 recited sidewall spacers being "essentially free of nitrogen" is not supported by the specification because the specification does not have support for the "terminology" in the limitation. Further, the Examiner states that since the specification points out that sidewall spacers may comprise silicon nitride that the recited terminology is not "co-extensive in scope with the specification".

Applicant notes by direction to MPEP § 2163.02 that the subject matter of a claim is not required to be recited using exact terminology as set forth in the specification, so long as the description clearly allows persons of ordinary skill in the art to recognize that the inventor had possession of the claimed subject matter at the time of filing. As set forth in the specification at page 17, lines 16-17, a material can consist essentially of silicon, oxygen and carbon. Although as noted by the Examiner the specification also discloses embodiments wherein the material can comprise nitrogen, there is nothing in the specification indicating or even suggesting that nitrogen is required. The disclosure of a material that

Appl. No. 09/603,147

can consist essentially of silicon, oxygen and carbon can reasonably convey to one skilled in the art that the material is essentially free of nitrogen. Accordingly, applicant's disclosure of a material consisting essentially of silicon, oxygen and carbon fully supports the recited material being essentially free of nitrogen. Applicant therefore respectfully requests withdrawal of the objection to independent claims 64 and 76, and of corresponding dependent claims 65-66 and 77, 79-81 and 83-84 in the Examiner's next action.

Claims 87-94 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner bases the rejection on a lack of antecedent basis for the recited "wordlines" in each of the two claims. Claims 87 and 88 have each been amended to recite "conductive gates" for which proper antecedent basis is supplied in independent claim 88 at line 3. Accordingly, applicant respectfully requests withdrawal of the § 112 rejection of independent claim 87 and dependent claims 88-94 in the Examiner's next action.

Each of claims 64-66, 68, 70-77, 79-81, 83-84 and 87-94 stand rejected under 35 U.S.C. § 103 as being unpatentable over applicant's admitted prior art (AAPA) in view of one or more of Spuler, U.S. Patent 5,935,873; Wolf, Silicon Processing for the VLSI Era, Vol. 2, pp. 354-355 (1990); Nobuhisa, JP10-223758 and McAnally, U.S. Patent No. 6,136,700. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following

Appl. No. 09/603,147

three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 68, 70-77, 79-81, 83-84 and 87-94 are allowable over the cited combinations of AAPA, Spuler, McAnally, Wolf and Nobuhisa for at least the reason that the references, either individually or as combined, fail to teach or suggest each and every limitation in any of those claims.

With respect to claims 64-66, without admission as to the propriety of the Examiner's rejections independent claim 64 and claims 65-66 which depend therefrom are cancelled.

Independent claim 68 recites a first electrode comprising conductively doped silicon extending within an insulative layer, at least a portion of the first electrode extending along and against a material that comprises from about 2% to about 20% carbon by weight. As noted by the Examiner, applicant's admitted prior art does not disclose or suggest the recited material comprising from about 2% to about 20% carbon. Further, AAPA does not disclose or suggest the recited electrode, at least a portion of which extends along and against a material comprising carbon.

Spuler discloses forming an oxide layer on the surface of a carbonized layer (col. 3, ll. 22-25), forming a contact opening in the oxide layer (col. 3, ll. 36-38) and subsequently filling the contact opening with one or more of tungsten, aluminum, and copper (col. 4, ll. 2-5). Spuler does not disclose or suggest the

Appl. No. 09/603,147

claim 68 recited first electrode comprising conductively doped silicon extending within an insulative layer and along and against a material that comprises from about 2% to about 20% carbon by weight. The Examiner states at page 12 that applicant's argument (in the previous response) concerning conductively doped silicon is moot as not being drawn to the subject of the invention. Applicant notes that the Examiner must consider the claim as a whole, including each and every claim limitation (MPEP § 2142). Furthermore, the invention set forth in the claims must be presumed to be that which applicant regards as the invention (MPEP § 2172 I). Accordingly, the recited conductively doped silicon is part of the invention as claimed and cannot be read out by the Examiner.

McAnally discloses etching through a stopping layer, forming a conductive material in a contact region and thereby forming a self-aligned contact (col. 5, ll. 3-32). McAnally does not disclose or suggest the recited first electrode comprising conductively doped silicon extending along and against a material that comprises from about 2% to about 20% carbon. Nobuhisa discloses formation of a contact hole and forming a tungsten conductor within the contact opening (paragraphs 49 and 50). Nobuhisa does not disclose or suggest the recited first electrode comprising conductively doped silicon, at least a portion of the first electrode extending along and against a material that comprises from about 2% to about 20% carbon. Wolf is relied on by the Examiner to show sidewall spacers formed from oxides. Wolf does not teach or suggest the claim 68

Appl. No. 09/603,147

recited electrode comprising conductively doped silicon extending along and against a material that comprises from about 2% to about 20% carbon.

As combined, AAPA, Spuler, McAnally, Nobuhisa and Wolf fail to disclose or suggest the claim 68 recited electrode comprising conductively doped silicon, at least a portion of the first electrode extending along and against a material that comprises from about 2% to about 20% carbon. Accordingly, independent claim 68 is allowable over the cited combinations of AAPA, Spuler, McAnally, Nobuhisa and Wolf.

Dependent claims 70-75 are allowable over the cited combinations of AAPA, Spuler, Nobuhisa, Wolf and McAnally for at least the reason that they depend from allowable base claim 68.

Independent claim 76 recites a carbon-containing material proximate wordlines, the carbon-containing material comprising from about 2% to about 20% carbon and being essentially free of nitrogen. Spuler discloses incorporation of carbon into at least a portion of a nitride layer to provide carbonized nitride for reducing a nitride etch rate (col. 2, ll. 49-55). Spuler does not disclose or suggest the recited carbon-containing material comprising from about 2% to about 20% carbon and being essentially free of nitrogen. Not one of Nobuhisa, Wolf, McAnally and AAPA disclose or suggest the recited carbon-containing material comprising from about 2% to about 20% carbon proximate wordlines. Further, not one of Nobuhisa, McAnally, AAPA and Wolf disclose or suggest the recited carbon-containing material comprising from about 2% to about 20% carbon being

Appl. No. 09/603,147

essentially free of nitrogen. As combined, Spuler, AAPA, Nobuhisa, McAnally and Wolf fail to disclose or suggest the claim 76 recited carbon-containing material proximate wordlines, the carbon-containing material comprising from about 2% to about 20% carbon and being essentially free of nitrogen. Accordingly, independent claim 76 is not rendered obvious by the combination of AAPA, Wolf, Nobuhisa, Spuler and McAnally and is allowable over these references.

Dependent claims 77, 79-81, and 83-84 are allowable over the cited combinations of AAPA, Spuler, McAnally, Nobuhisa and Wolf for at least the reason that they depend from allowable base claim 76.

Independent claim 87 recites a node location between a pair of conductive gates, a carbon-containing material extending along sidewalls of the conductive gates and an insulative material over the conductive gates and over at least some of the carbon-containing material. Independent claim 87 further recites at least a portion of the insulative material being directly against the conductive gates. As noted above and as acknowledged by the Examiner at page 6 of the present action, AAPA fails to disclose or suggest the recited carbon-containing material extending along sidewalls of a pair of conductive gates. Spuler discloses a nitride layer comprising carbon over a substrate, and an oxide layer over the nitride layer. Spuler does not disclose or suggest the recited portion of an insulative layer being directly against conductive gates. Further, Spuler does not disclose or suggest the recited carbon-containing material having insulative

Appl. N . 09/603,147

material thereover, a portion of the insulative material being directly against conductive gates.

Nobuhisa discloses formation of an aluminum copper wiring layer 3, formation of an oxide film over the wiring layer and a "difficulty etching layer" 20, which can comprise carbon over the oxide layer (paragraphs 36-38 and 53). Nobuhisa does not disclose or suggest the claim 87 recited node location between a pair of conductive gates. Further, Nobuhisa does not disclose or suggest the claim 87 recited carbon-containing material extending along sidewalls of conductive gates. Additionally, Nobuhisa does not disclose or suggest the recited insulative material over conductive gates.

McAnally discloses formation of a stopping layer 110 over a conductive gate and formation of an insulating layer 112 over stopping layer 110 (col. 3, ll. 48-50). McAnally does not disclose or suggest the claim 87 recited carbon-containing material extending along sidewalls of conductive gates, and an insulative material over the conductive gates, at least a portion of the insulative material being directly against the conductive gates. As discussed above, Wolf fails to disclose or suggest the recited carbon-containing materials extending along sidewalls of conductive gates. Further, Wolf does not disclose or suggest an insulative material over at least some of the carbon containing material and at least a portion of the insulative material being directly against the conductive gates.

Appl. No. 09/603,147

As combined, AAPA, Nobuhisa, McNally, Spuler and Wolf fail to disclose or suggest the claim 87 recited node location between a pair of conductive gates having a carbon-containing material extending along the sidewalls of the conductive gates, an insulative material being over at least some of the carbon containing material, at least a portion of the insulative material being directly against the conductive gates. Accordingly, independent claim 87 is not rendered obvious and is allowable over the cited combinations of Spuler, McNally, AAPA, Wolf and Nobuhisa.

Dependent claims 88-94 are allowable over the cited combinations of AAPA, Spuler, Nobuhisa, McNally and Wolf for at least the reason that they depend from allowable base claim 87.

Claims 70, 72, and 73; claims 74 and 75; and claims 83 and 84 stand objected to as being substantial duplicates. The Examiner states that claims 70, 72 and 73 are substantial duplicates because they are so close in content that they both cover the same thing despite slight differences in wording. As set forth in the response to the previous action, the transitional phrases "comprising" and "consisting essentially of" are well recognized as being of a different scope. Additionally, the transitional phrases are not part of the preamble as stated by the Examiner at page 12 of the present action. As further discussed in the previous response, the recited material comprising silicon and carbon in claim 70 has a different scope than the claim 72 recited material comprising silicon, oxygen and carbon. Accordingly, the Examiner's objections to claim 70, 72, 73,

Appl. No. 09/603,147

74, 75, 83 and 84 are improper. Applicant respectfully requests withdrawal of the substantial duplicate objection by the Examiner. If such rejection is to be maintained, applicant respectfully requests a telephone call to discuss this issue. Further, applicant requests that the discussion be conducted in the presence of the Examiner's supervisor.

For the reasons discussed above claims 68, 70-77, 79-81, 83-84 and 87-94 are allowable. Accordingly, applicant respectfully requests formal allowance of such pending claims in the Examiner's next action.

Respectfully submitted,

Dated: October 2, 2002

By: Jennifer J. Taylor
Jennifer J. Taylor, Ph.D.
Reg. No. 48,711

FAX COPY RECEIVED

OCT 02 2002

TECHNOLOGY CENTER 2800

Application Serial No. 09/603,147
Filing Date June 23, 2000
Inventor John T. Moore
Assignee Micron Technology, Inc.
Group Art Unit 2813
Examiner Kielin, E.
Attorney's Docket No. MI22-1443
Title: Capacitor Constructions, DRAM Constructions and Semiconductive Material
Assemblies

**VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING
RESPONSE TO JULY 3, 2002 OFFICE ACTION**

In the Claims

The claims have been amended as follows. Underlines indicate insertions
and ~~strikeouts~~ indicate deletions.

Claims 64-66 are cancelled.

87. (Amended) A semiconductor construction comprising:
a semiconductor substrate;
a pair of conductive gates over the substrate, the conductive gates having
sidewalls;
a node location between the pair of conductive gates;
a carbon-containing material extending along the sidewalls of the ~~wordlines~~
conductive gates; and

Appl. No. 09/603,147

an insulative material over the ~~wordlines~~ conductive gates and over at least some of the carbon-containing material, at least a portion of the insulative material being directly against the ~~wordlines~~ conductive gates.

88. (Amended) The semiconductor construction of claim 87 further comprising;

an opening in the insulative material between the pair of ~~wordlines~~ conductive gates, the opening having a base comprising a surface of the substrate; and

a capacitor construction within the opening and directly against the surface of the substrate.

-END OF DOCUMENT-